



**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant:	Lloyd W. Marsden	Examiner:	Cheung, William K
Serial No.:	10/826,122	Group Art Number:	1713
Filed:	April 15, 2004	Docket No.:	76721.011600
Confirmation No.	9871		
Title:	Polymeric Stabilization Composition and Method		

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CERTIFICATE UNDER 37 CFR 1.10  
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Date of Deposit: October 14, 2005

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office To Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450.

By: Sylvia A. Gei  
Name: Sylvia A. Gei

**DECLARATION UNDER 37 C.F.R. § 1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

I, Lloyd W. Marsden, P.E., do hereby state and declare as follows:

1. I am the inventor in the above-identified application.
2. I graduated in 1972 from the South Dakota School of Mines and Technology and received a Bachelor of Science degree in the field Mechanical Engineering. Following graduation I studied for 1 year in the field of Structural Engineering.
3. I have been working in the field of polymers since 1981. I have spent the 22 years principally in research and development of guar gum in industrial applications. I am currently General Manager at Rantec Corporation.

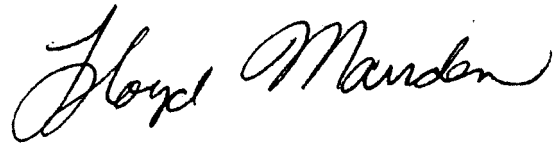
4. I am a licensed Professional Engineer in the states of Wyoming (Registration Number 4088 ) and South Dakota (Registration Number 3018).
5. I am familiar with the above-identified application, U.S. Patent No. 5,459,181 to West et al. (West) and Ainley et al. (SPE 25463: A comparison of Delay Methodology, Production Operations Symposium, Oklahoma City, OK, March 21023, 1993. pp 517-520, hereinafter "Ainley").and have read the Office Action of July 14, 2005 (Action).
6. I am familiar with the testing of viscosity using different instruments including viscometers and rheometers and I have at least once attempted to correlate viscosity measurements obtained between the two instruments. Attached as Attachment A are the results of tests performed in January and March of 1984 to compare the measurements made by a Brookfield RVT viscometer at 20 rpm and a Baroid rheometer at 100 rpm on a sample of polymer. The results of these tests are presented in a spreadsheet and a graph along with a copy of the actual laboratory notebook pages. The graph clearly shows that there is no linear correlation between the viscosity obtained by a rheometer and the viscosity measured by a viscometer.
7. I respectfully submit that obtaining a particular polymer/crosslinker concentration in an aqueous mixture with such a low viscosity that, when applied, still results in a substantially insoluble crosslinked polymer coating on the surface requires experimentation that does not qualify as routine experimentation for a person skilled in the art. For example, over 197 experimental tests were performed over the course of more than 12 months to create a low viscosity but high polymer concentration aqueous mixture that could be easily applied via a hydroseeder yet still produced a strong, crosslinked polymer film that was substantially insoluble.
8. I respectfully submit that West when practiced does not result in an aqueous mixture as now claimed in the amended claims pending before the USPTO in this application.
9. West describes a dry blend of polymer, crosslinker and catalyst that is mixed into water in a single step, so that all of the components of the dry blend are added at once. My

experiments in the field and in the lab, see Attachment B containing various records of laboratory experiments done over a period of time, indicate that 15 minutes after mixing a dry blend meeting West's specification in a single step, the viscosity is substantially higher than using the inventive two-step mixing technique disclosed in the application.

10. The experiments in Attachment B show a comparison test using West's disclosed composition of polymer and crosslinker. In the experiment we used Rantec J3000, which is a unmodified natural guar gum, and an otherwise similar depolymerized guar gum sold under the Rantec trademark GUARDIAN. The results of this experiment showed the claimed invention created a low viscosity aqueous solution of polymer that could not be reproduced by practicing West. The results also showed that the polymer film resulting when the claimed aqueous material dried was substantially insoluble and suitable for binding use in a natural environment.
11. I further submit that the properties of the aqueous mixture created by the inventive method were unexpected and differ to such an extent that the claimed aqueous mixture is a marked improvement over the disclosure of West in its ease of application and its reduction in the amount of water necessary to achieve the same density of polymer coating on a surface.
12. For all of the above reasons I respectfully submit to the Examiner that neither West nor Ainley disclose a composition or method that result in the claimed compositions. One skilled in the art would not find our claimed invention obvious and would not even consider making our invention solely because of reading West, and would know that any variation in mixing method that is not specifically disclosed in the art would have any effect on viscosity of aqueous polymer mixtures.
13. I declare further that all statements made herein of my own knowledge are true; that all statements made herein on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the

United States Code and that such willful false statements may jeopardize the validity of this application or any patents issuing thereon

Executed this 14th day of October, 2005, at Ranchester, Wyoming, USA.

A handwritten signature in black ink, reading "Lloyd Marsden". The signature is written in a cursive, flowing style with a large initial "L".

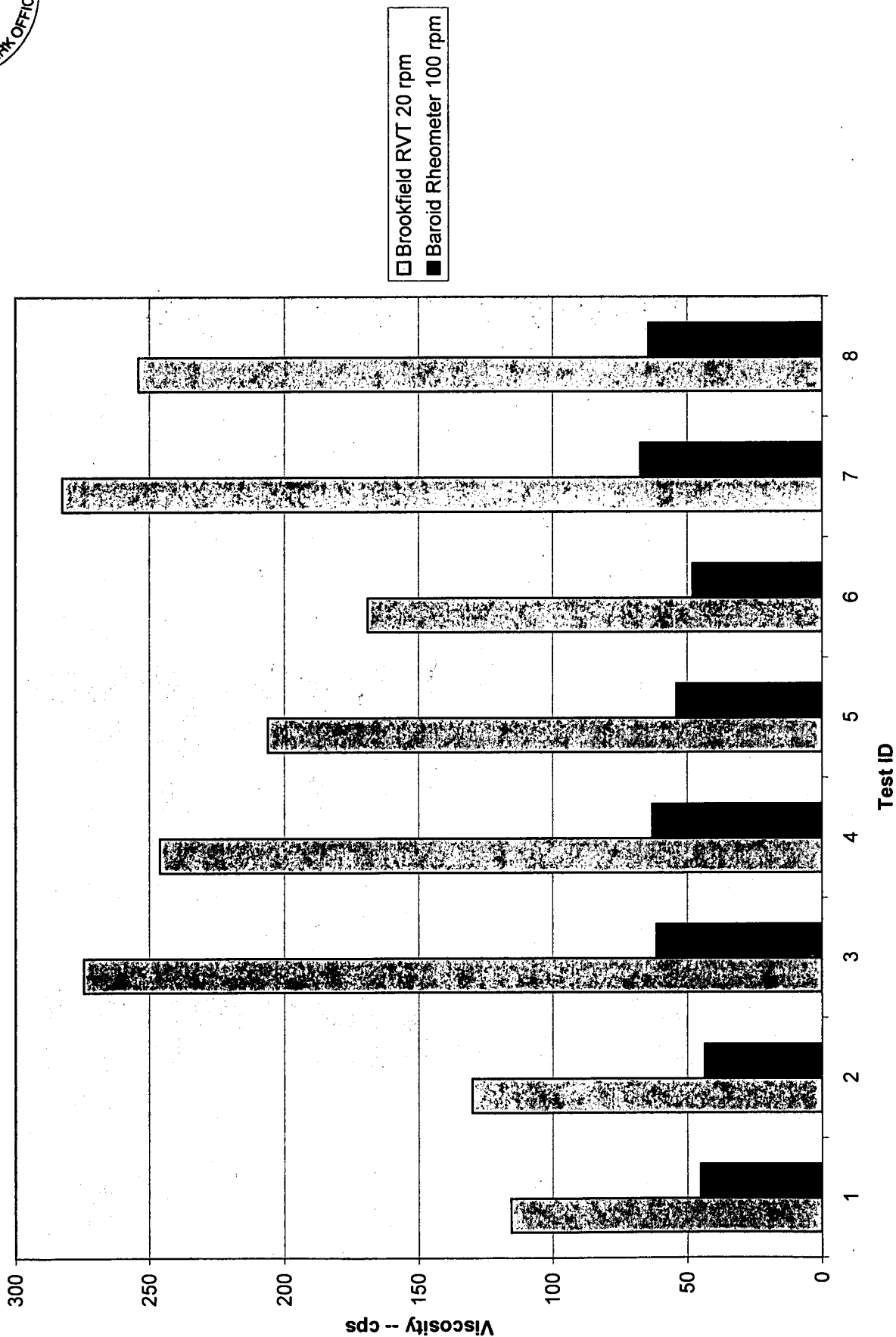
Lloyd W. Marsden, P.E.

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# **ATTACHMENT “A”**



Comparison of Viscosity Measurements from an RVT Viscometer and a Rheometer



Rantec Corporation  
12-Oct-05

Product WGA-1 Guar based fracturing gel

Lot No.	Date	Hydration Time	Viscosity -- cps		Ratio
			Brookfield RVT 20 rpm	Baroid Rheometer 100 rpm	
A243	3-Jan-84	5 min	115.5	45	0.3896
A243	3-Jan-84	5 min	130	43.5	0.3346
A243	3-Jan-84	1 hr	274.5	61.5	0.2240
A244	3-Jan-84	2 hr	246	63	0.2561
A261	14-Jan-84	5 min	206	54	0.2621
A261	14-Jan-84	5 min	169	48	0.2840
A261	14-Jan-84	1 hr	282.5	67.5	0.2389
A261	14-Jan-84	1 hr	254	64.5	0.2539

# VISCOSITY TEST REPORT

DATE: 3/14/84  
BY: TS

FOR: WGAI AZ6M1

TEST INFORMATION:

.48% = 2.4g/500mL

SAMPLE	MODEL	SPINDLE	R.P.M.	DIAL READING	FACTOR	VISCOSITY CPS.	TEMP. °C	TIME	350	NOTES	350
	Brkfd	1	12	41.2	5	2060	169.0	5'	359		350
				60.9		3045	279.5	15'	409		401
				63.4		37.0	296.0	30'	424		411
				56.5		282.5	254.0	1h	454		426
				45.6		228.0	188.5	2h	554		456
				3.6				4h			556
				3.6				24h			
	NL		300	28.5	1	28.5	27.5	5'			
	Baroid		100	18.0	3	54.0	48.0				
			300	33.5	1	33.5	32.5	15'			
			100	21.0	3	63.0	61.5				
			300	35.5	1	35.5	35.0	30'			
			100	22.5	3	67.5	64.5				
			600	47.5	.5	23.75	23.25	1h			
			300	36.0	1	36.0	35.0				
			100	22.5	3	67.5	64.5				
			300	35.0	1	35.0	34.0	2h			
			100	21.5	3	64.5	63.0				
			300	15.0	1			4h			
			100		3						
			300	14.0	1	15.0					
			100	8.0	3						

CONCLUSIONS:



# VISCOMETER TEST REPORT

DATE: 1/3/84  
BY: JS

FOR: A243 WGA1

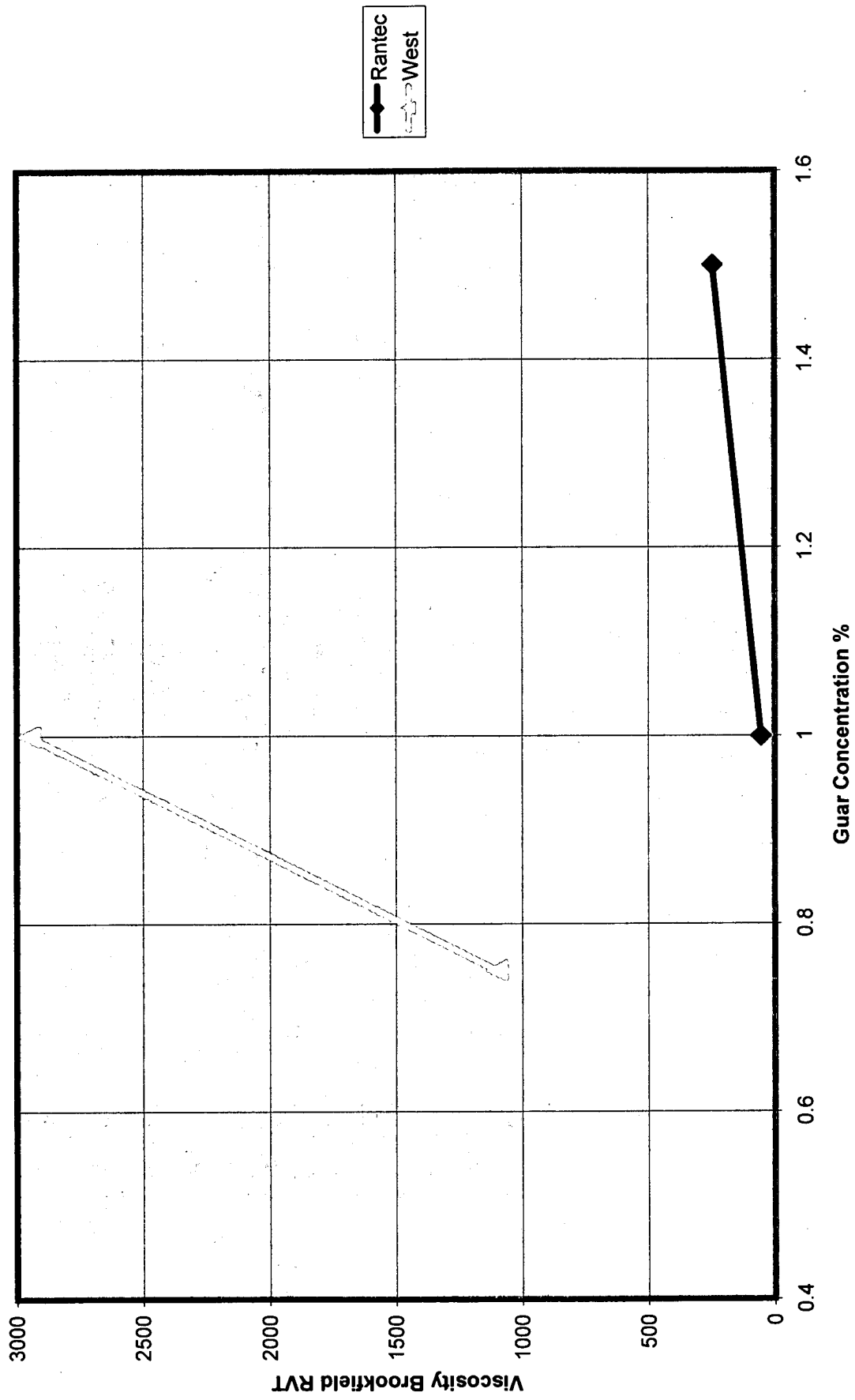
TEST INFORMATION:

4820

SAMPLE	MODEL	SPINDLE	R.P.M.	DIAL READING	FACTOR	VISCOSITY CPS.	TEMP. °C	TIME	NOTES
	Brkfd	1	12	23.1	5	115.5	100.0	5'	1005
				48.0		2400	246.5	15'	1010
				57.5		2875	274.5	30'	1020
				54.9		2745	246.0	1h	1035
				42.4		212.0	17.0	2h	1105
				—		—	—	4h	1205
				2.7		—	135	24h	205
	NL		300	25.0	1	250	245	5'	207
	Baroid		100	15.0	3	450	435		
			300	30.5	1	305	31.0	15'	
			100	18.0	3	540	54.0		
			300	31.0	1	31.0	31.0	30'	
			100	18.5	3	55.5	55.5		
			600	45.0	.5	22.5	22.5	1h	
			300	33.0	1	33.0	33.0		
			100	20.0	3	600	60.0		
			300	33.0	1	33.0	32.5	2h	
			100	20.0	3	60.0	51.0		
CONCLUSIONS:			300	—	1	—	—	4h	
			100	—	3	—	—		
			300	—	1	—	13.5	24h	
			100	—	3	—	19.5		

## **ATTACHMENT “B”**

Viscosity vs Concentration



Viscosity Comparison  
Rantec -- West

Compound ID		Date	Guar Concentration	Viscosity - 15 min Brookfield RVT 20 rpm	Guar Type
West	IG150	15-Apr-03	0.75	1020	J3000
West	IG214	12-Oct-05	1	2950	J3000
West	IG207	11-Oct-05	0.75	1100	J3000
Rantec	IG209	11-Oct-05	1	55	Guardian
Rantec	IG210	11-Oct-05	1.5	245	Guardian

# INSOLUBLE FILM TESTS

BY Carly TEST ID # IG150 DATE 4/15/03

POLYMER:	
MANUFACTURER:	<u>HGL</u>
TYPE:	<u>53000</u>
RT #	
%	<u>0.75</u>
GRAMS	<u>3.75</u>

CROSSLINKER:	
MANUFACTURER:	<u>BASF</u>
TYPE:	<u>DMOU</u>
RT#	
%	
GRAMS	<u>0.38</u>

OTHER ADDITIVES:	
%	<u>Ammonium Sulfate 0.23 Gm</u>
GRAMS	<u>0.23</u>

WATER:	
TYPE	<u>Distilled</u>
AMOUNT	<u>500 ML</u>

TIME POLYMER ADDED 7.26  
 MIX 2 MINUTES 7:28  
 AGE 15 MINUTES IN WATER BATH  
 TAKE 15 MINUTE VISCOSITY: 7.41  
 RVT 20 rpm  
 SPINDLE # 2 FACTOR 20

COMMENTS: %  
 ① 53000 86  
 DMOU 8.6  
 Am. Sul 5.4

6.75  
3.75  
0.38  
0.23  
4.36

② VISCOSITY AT 15 MIN. 2A CHECK PH 6.66  
 ③ Add 26.9 Gm FIBER, MIX  
 ④ CHECK PH PH 5.42

READING 51  
 VISCOSITY (CPS) 1020

CAST FILM	RATE LB/ACRE	DISH USED	GMS FLUID PER DISH
		<u>Aluminum Pan</u>	

RESULTS AFTER AIR DRYING:  
Add ENTIRE BATCH TO PAN FALLS AFTER UNDER WATER

PAQUINITY B

CONTROL

# INSOLUBLE FILM TESTS

BY LWM TEST ID # IG207 DATE 11 OCTOS  
TO MATCH IG 150

POLYMER:	
MANUFACTURER:	<u>HGL</u>
TYPE:	<u>J3000</u>
RT #	
%	<u>0.75</u>
GRAMS	<u>3.75</u>

CROSSLINKER:	
MANUFACTURER:	<u>BASF</u>
TYPE:	<u>Dmou</u>
RT#	
%	
GRAMS	<u>0.38</u>

OTHER ADDITIVES:	
%	<u>Ammonium Sulfate</u>
GRAMS	<u>0.236m</u>

WATER:	
TYPE	Distilled
AMOUNT	500 ML

TIME POLYMER ADDED 9:35  
 MIX 2 MINUTES  
 AGE 15 MINUTES IN WATER BATH  
 TAKE 15 MINUTE VISCOSITY: 9:50  
 RVT 20 rpm  
 SPINDLE # 3 FACTOR 50  
 READING 22  
 VISCOSITY (CPS) 1100

COMMENTS: Overall Dry Mat'l.  
J3000 26 3.75  
Dmou 8.6 0.38  
Am. Sulf. 5.4 0.23  
4.36

CAST FILM	RATE LB/ACRE	DISH USED	GMS FLUID PER DISH
RESULTS AFTER AIR DRYING:			

RESULTS AFTER AIR DRYING:			

# INSOLUBLE FILM TESTS

BY Lwm TEST ID # IG209 DATE 11 OCT 05

POLYMER:	
MANUFACTURER:	<u>Ranec</u>
TYPE:	<u>GUARDIAN D3347</u>
RT #	
%	<u>1.0</u>
GRAMS	<u>5.0</u>

CROSSLINKER:	
MANUFACTURER:	<u>Ranec</u>
TYPE:	<u>XL</u>
RT #	
%	
GRAMS	<u>2.0</u>

OTHER ADDITIVES:	
%	
GRAMS	

WATER:	
TYPE	<u>Distilled</u>
AMOUNT	<u>500 ML</u>

TIME POLYMER ADDED 9:59  
 MIX 2 MINUTES  
 AGE 15 MINUTES IN WATER BATH  
 TAKE 15 MINUTE VISCOSITY: 9.14  
 RVT 20 rpm  
 SPINDLE # 1 FACTOR 5  
 READING 11  
 VISCOSITY (CPS) 55

COMMENTS: 100XL First

CAST FILM	RATE LB/ACRE	DISH USED	GMS FLUID PER DISH
RESULTS AFTER AIR DRYING:			

# INSOLUBLE FILM TESTS

BY CWM TEST ID # IG210 DATE 11 OCT 05

POLYMER:	
MANUFACTURER:	<u>RANOC</u>
TYPE:	<u>GUARDIAN D3342</u>
RT #	
%	<u>1.5</u>
GRAMS	<u>7.5</u>

CROSSLINKER:	
MANUFACTURER:	<u>RANOC</u>
TYPE:	<u>XL</u>
RT #	
%	
GRAMS	<u>3.0</u>

OTHER ADDITIVES:	
%	
GRAMS	

WATER:	
TYPE	Distilled
AMOUNT	500 ML

TIME POLYMER ADDED 10:16  
 MIX 2 MINUTES  
 AGE 15 MINUTES IN WATER BATH  
 TAKE 15 MINUTE VISCOSITY: 10:31  
 RVT 20 rpm  
 SPINDLE # 1 FACTOR 5  
 READING 49  
 VISCOSITY (CPS) 245

COMMENTS: XL App First

CAST FILM	RATE LB/ACRE	DISH USED	GMS FLUID PER DISH
RESULTS AFTER AIR DRYING:			



# INSOLUBLE FILM TESTS

BY Cwm TEST ID # IG 214 DATE 20 OCT 05

POLYMER:	
MANUFACTURER:	<u>HGCL</u>
TYPE:	<u>J3000</u>
RT #	
%	<u>1.0</u>
GRAMS	<u>5.0</u>

CROSSLINKER:	
MANUFACTURER:	<u>BASF</u>
TYPE:	<u>D100</u>
RT#	
%	
GRAMS	<u>0.5</u>

OTHER ADDITIVES:	
%	<u>Ammonium Sulfate</u>
GRAMS	

WATER:	
TYPE	Distilled
AMOUNT	500 ML

TIME POLYMER ADDED 14:35  
 MIX 2 MINUTES  
 AGE 15 MINUTES IN WATER BATH  
 TAKE 15 MINUTE VISCOSITY: 14:50  
 RVT 20 rpm  
 SPINDLE # 3 FACTOR 50

READING 59

VISCOSITY (CPS) 2950

COMMENTS:

<u>53000</u>	<u>%</u>
<u>D100</u>	<u>86</u>
<u>Am. Sulf</u>	<u>8.6</u>
	<u>0.5</u>
	<u>0.314</u>
	<u>581</u>

CAST FILM RATE LB/ACRE DISH USED

GMS FLUID PER DISH

RESULTS AFTER AIR DRYING:

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